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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,795	06/06/2006	Daniel Henry Densham	GJE-1059	3336

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SALIWANCHIK LLOYD & SALIWANCHIK
A PROFESSIONAL ASSOCIATION
PO BOX 142950
GAINESVILLE, FL 32614-2950

EXAMINER	
LUM, LEON YUN BON	
ART UNIT	PAPER NUMBER
1641	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,795	DENSHAM, DANIEL HENRY	
	Examiner	Art Unit	
	Leon Y. Lum	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/1/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7, 9, and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Natan (US 6,025,202).

Natan teaches SERS substrates (i.e. sensing element) comprising two-dimensional arrays of colloidal metal particles (i.e. matrix of discrete particles formed from a material), including Au particles (i.e. gold), immobilized onto glass surfaces (i.e. glass substrate). See column 2, line 66 to column 3, line 21. Natan also teaches that the colloid metal particles are coated with protein (i.e. having biologically active molecule bound thereto). See column 19, lines 30-67 and Figure 20. Furthermore, Natan teaches that colloid Au particle monolayers can be used in surface plasmon resonance detection (i.e. capable of supporting surface electromagnetic waves). See column 38, lines 55-59.

Regarding claims 4-5, Natan teaches 12-nm diameter colloidal Au. See column 4, line 2.

Regarding claims 11-13, Natan teaches surface characterization using SERS with an ion laser (i.e. coherent radiation source) and scattered radiation was detected by a diode array spectrophotometer (i.e. detector), and wherein SERS substrates having immobilized protein-Au complexes can be used as biosensors (i.e. applying electromagnetic radiation; monitoring changes in radiation). See column 21, lines 21-51 and column 35, line 25 to column 36, line 12.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Natan (US 6,025,202) in view of Mirkin et al (US 6,506,564 B1) (hereinafter "Mirkin").

The teachings of Natan have been disclosed above and Natan additionally teaches that defined spaces between nanoparticles ensures that the particles are closely-spaced, but physically separated, in order to maximize the nanoparticle array for analyte characterization. See column 4, line 52 to column 5, line 16. However, Natan fails to teach that the particles are linked via a polymer molecule.

Mirkin teaches nanoparticles cross-linked with double-stranded oligonucleotides, in order to create defined spaces between nanoparticles. See column 46, lines 4-12 and Figure 4.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Natan with nanoparticles cross-linked with double-stranded oligonucleotides, as taught by Mirkin, in order to create defined spaces between nanoparticles. The defined spaces between nanoparticles ensures that the particles are closely-spaced, but physically separated, in order to maximize the nanoparticle array for analyte characterization, thereby providing the motivation to combine the teachings of Mirkin with the teachings of Natan. In addition, one of ordinary skill in the art at the time of the invention would have had a reasonable expectation of success in including oligonucleotides as crosslinks between nanoparticles, as taught by Mirkin, in the apparatus of Natan, since Natan teaches the same type of nanoparticles.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Natan (US 6,025,202) in view of Densham (WO 99/05315).

The teachings of Natan have been disclosed above, but they fail to teach that the protein is a polymerase enzyme.

Densham teaches a polymerase enzyme immobilized to a solid support, in order to detect a target polynucleotide. See page 2, lines 25-35.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Natan with a polymerase enzyme immobilized to the nanoparticles, as taught by Densham, in order to detect a target polynucleotide. The ability to detect a different type of biomolecule, in addition to the proteins of Natan, provides the motivation to combine the teachings of Densham with the teachings of Natan. In addition, one of ordinary skill in the art at the time of the invention would have had a reasonable expectation of success in including the polymerase enzyme, as taught by Densham, in the apparatus of Natan, since Natan teaches protein-immobilized nanoparticles, and the polymerase enzyme is one type of protein.

Conclusion

7. No claims are allowed.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Y. Lum whose telephone number is (571) 272-2878. The examiner can normally be reached on weekdays from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leon Y. Lum
Patent Examiner
Art Unit 1641

LONG V. LE 02/01/07
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600